**The Crash of Flight 143**

*The Importance of Units*

Read the article “The Crash of Flight 143,” *ChemMatters*, October, 1996, pp. 12-15 on the class website

Answer the following questions.

1. What are the three possible causes of the 767’s fuel pump alarm?
2. The second fuel pump alarm made which possible cause most likely?
3. The faulty calculation occurred when converting from liters to kilograms. Why isn’t jet fuel measured by volume like gasoline is in cars?
4. What is density and why is it being used as a conversion factor?
5. What units were needed on the number 1.77 to express the density of jet fuel?
6. What units *should they have used* in order to make the correct conversion?
7. How did their calculation error affect the amount of fuel that was pumped into the plane?
8. Suppose the ground crew conducted the drip procedure and found that the tanks contained 8,550 L of fuel. What volume of fuel would need to be added to complete the flight? (Refer to the “Crash Course in Density” portion of the article for help). Show all your work.

|  |  |
| --- | --- |
| Volume on board | 8,550 L |
| Mass on board |  |
| Mass required for flight | 22,300 kg |
| Mass to be added |  |
| Volume to be added |  |

1. Hopefully this article shows you the importance of using units in all of your calculations. Can you think of other examples in which it would be dangerous to drop the units (besides Chemistry class!) ?